

GLOBAL CLIMATE HIGHLIGHTS

MAJOR CLIMATIC EVENTS AND ANOMALIES AS OF DECEMBER 12, 1992

1. Western United States:

STORMS POUND REGION.

Up to 435 mm of precipitation fell on portions of the Sierra Nevadas and Cascades as two storms brought inundating precipitation and high winds to the region. By the weekend, as much as 215 cm of snow covered parts of the Sierra Nevadas while urban flooding snarled traffic in the Los Angeles, CA metropolitan area (see page 4) [Episodic Event].

2. Central and Southeastern United States:

WIDESPREAD WETNESS SUBSIDES, BUT STILL UNUSUALLY CHILLY.

Only 10 to 30 mm of precipitation fell on scattered portions of the central and northern Great Plains while 20 to 50 mm moistened the southern Great Plains and Southeast. Widespread moisture surpluses subsided by the end of the week, although pockets of wetness remained in the south-central Great Plains and southern Florida [Ended after 6 weeks]. Meanwhile, near to above normal temperatures overspread the Great Plains, but weekly departures of -2°C to -5°C were observed across the High Plains and Southeast [3 weeks].

3. Northeastern United States:

FIERCE NOR'EASTER BLASTS REGION.

A powerful storm brought up to 105 cm of snow to higher elevations and dumped as much as 180 mm of precipitation closer to the Atlantic Coast. In Massachusetts, 24-hr. snowfall totals approached 70 cm at a few locations. The heavy rains along the Atlantic Coastal Plain combined with onshore wind gusts of up to 145 kph to produce near-record high tides and widespread coastal, lowland, and urban flooding (see front cover) [Episodic Event].

4. Central South America:

STILL COOL IN BOLIVIA.

Temperatures averaged 2°C to 4°C below normal as the recent cool spell continued [5 weeks].

5. Central South America:

ABNORMALLY WET CONDITIONS DEVELOP.

Weekly precipitation totals of 50 to 100 mm were widespread across central and northeastern Bolivia, much of Paraguay, and east-central and northeastern Argentina, with isolated amounts approaching 200 mm in the latter area. Six-week moisture surpluses reached 200 to 300 mm in portions of Brazil and Bolivia. According to press reports, a mudslide north of La Paz along the

Andes foothills buried a remote mining camp, taking hundreds of lives [5 weeks].

6. Central and Northern Europe:

ABOVE NORMAL PRECIPITATION CONTINUES.

Only light totals (under 20 mm) were measured in northern and western Poland, southern sections of Norway and Sweden, and eastern Scotland, but most other areas remained entrenched in a wet and stormy pattern. Between 20 and 50 mm of precipitation fell on most of Germany, France, the Alps, northern Italy, Croatia, Slovenia, the Benelux countries, Denmark, and the British Isles, with scattered totals topping 100 mm in northern Italy. According to press reports, more than 70% of Venice was flooded as a result of torrential downpours on Tuesday [11 weeks].

7. Southwestern Europe and Northwestern Africa:

PRECIPITATION DEFICITS DEVELOP.

Most locations reported under 10 mm of rain, although 20 to 30 mm dampened parts of northern Morocco, allowing the dry spell that began around the beginning of November to continue (see page 2) [6 weeks].

8. Southwestern Asia:

MILDER CONDITIONS PREVAIL.

Above normal temperatures were reported across western Turkey, and near to slightly below normal readings elsewhere signalled an end to the brief cold spell [Ended after 3 weeks].

9. Central China:

LIGHT RAINS PROVIDE LIMITED RELIEF.

Most of Southeastern China received 20 to 30 mm of rain, decreasing moisture deficits as the region's normals continued to decline. Pockets of dryness were still observed in central and south-central China where less than 10 mm of precipitation fell last week [Ending after 22 weeks].

10. Central and Southern Australia:

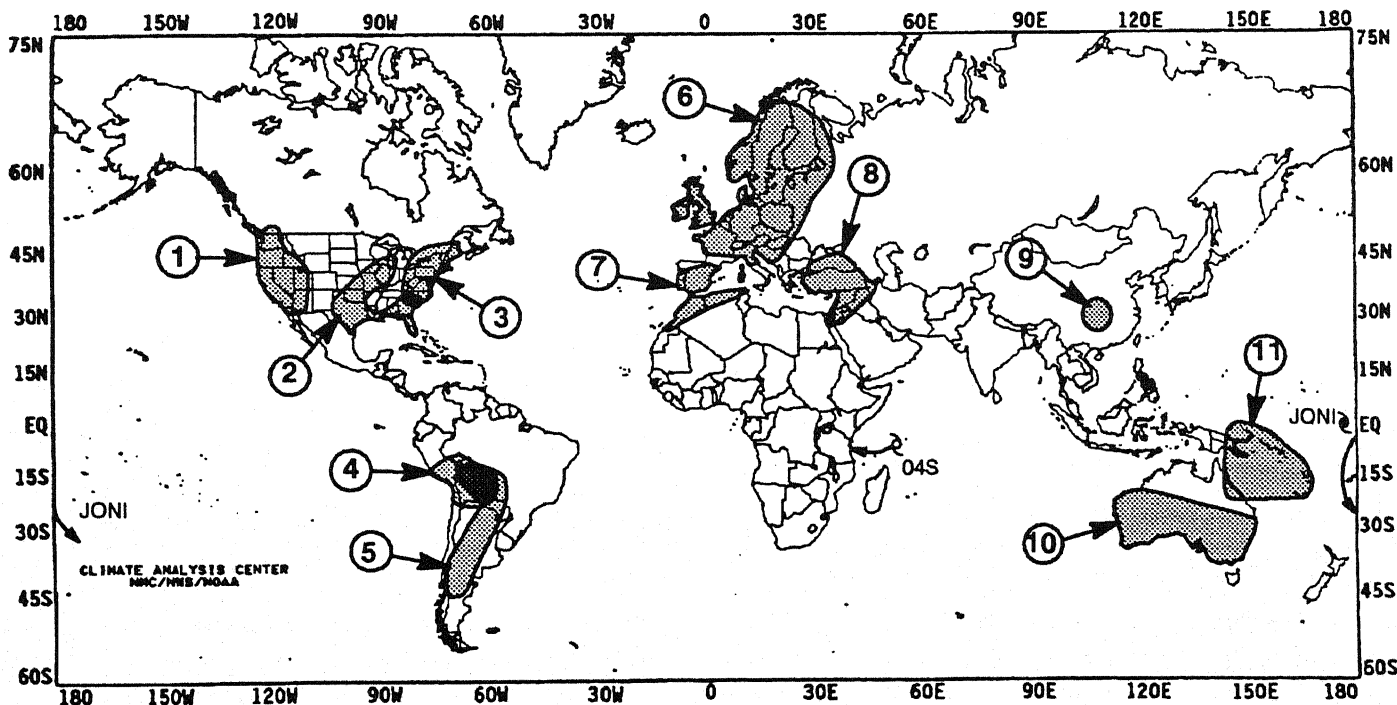
TEMPERATURES MODERATE.

Weekly departures of only -1°C to -3°C covered most of the region as the cool spell diminished [Ending after 6 weeks].

11. Northeastern Australia and Western Pacific Islands:

MODERATE RAINS REDUCE RAINFALL SHORTAGES.

For a second consecutive week, scattered moderate amounts of rain (30 to 80 mm) decreased the region's moisture deficits. Pockets of large shortfalls remained, but the widespread dryness observed earlier in the wet season was alleviated [Ended after 12 weeks].

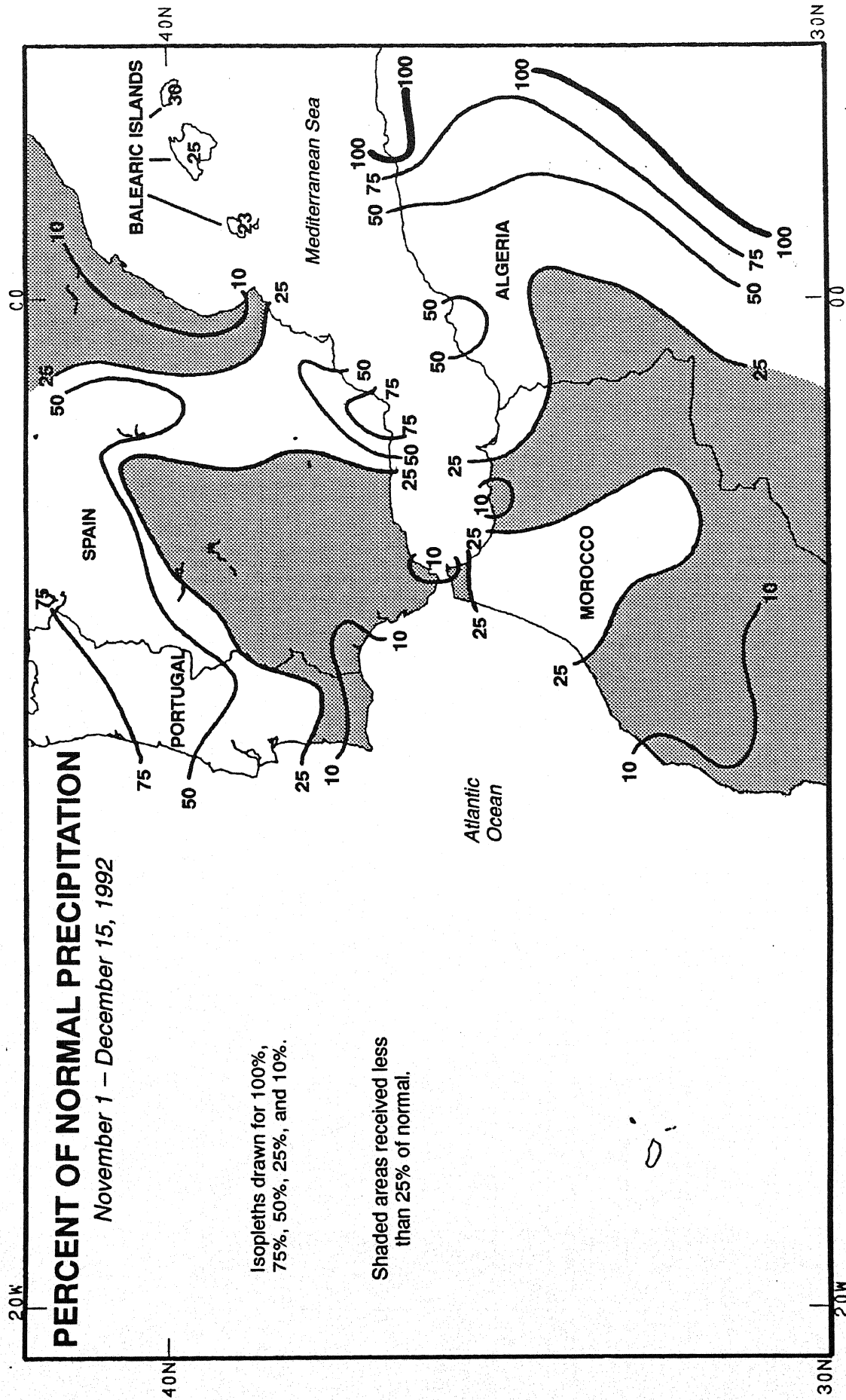


EXPLANATION

TEXT: Approximate duration of anomalies is in brackets. Precipitation amounts and temperature departures are this week's values.

MAP: Approximate locations of major anomalies and episodic events are shown. See other maps in this Bulletin for current two week temperature anomalies, four week precipitation anomalies, long-term anomalies, and other details.

GLOBAL CLIMATE HIGHLIGHTS FEATURE



VERY DRY CONDITIONS OBSERVED ACROSS MUCH OF THE IBERIAN PENINSULA AND EXTREME NORTHWESTERN AFRICA. During November 1 – December 15, 1992, well below normal precipitation fell across the Balearic Islands, central and southern sections of Spain and Portugal, extreme northwestern Algeria, and the northern half of Morocco. Many locations in northwestern Africa and the southern Iberian Peninsula received only 10 to 45 mm during this period while 100 mm to 250 mm fell across northern portions of Spain and Portugal. Accumulated deficits reached 170 mm in extreme southern Spain and Gibraltar. According to press reports, the dryness combined with gusty winds to create ideal conditions for the rapid development and spread of wildfires. One fire had consumed over 2,000 hectares of cork and pine wood along the eastern coast of Spain, forcing the evacuation of hundreds of individuals.

UNITED STATES WEEKLY CLIMATE HIGHLIGHTS

FOR THE WEEK OF DECEMBER 6 – 12, 1992

A massive storm system pounded the Northeast and mid-Atlantic during the latter part of the week with heavy snow over inland areas and record high tides, high wind, and heavy rain along the coast from Virginia to New England. Onshore winds of up to 90 mph helped generate some of the highest tides of the century and combined with torrential rain to cause major coastal flooding and beach erosion from Maryland's eastern shore northward to Cape Cod. Numerous homes along the Delaware, New Jersey, Long Island, and Cape Cod shore line were destroyed or severely damaged, according to press reports. The storm left highways submerged, subway, train, and airport services suspended, and power cut for hundreds of thousands of customers. Up to 42 inches of snow buried the higher elevations of Pennsylvania, West Virginia, Maryland, New York, and New England, and at least 18 deaths were linked to the storm (see front cover). Early in the week, a strong Pacific storm (which eventually helped fuel the Nor'easter) battered southern California with high wind and heavy rain that flooded freeways and homes. In San Diego county, a waterspout moved onshore, destroying a mobile home park. The storm also dropped heavy rains that undermined railroad tracks on an overpass in Los Angeles, causing four freight trains to derail, and dumped up to 4 feet of snow on the Sierra Nevadas. State water officials, however, stressed that much more precipitation is still needed to end the drought, which is entering its seventh year in some areas.

The week commenced with a powerful Pacific frontal system bringing rain and snow to California and the Pacific Northwest. The storm pounded southern California with high wind and flooding, but provided needed moisture for the long-term drought in the Far West. On Tuesday, the system spread into the Great Basin and Southwest, dumping heavy rain and snow on Arizona. Meanwhile, a second Pacific system spread more precipitation into northern California, western Oregon, and western Washington. Farther east, the first Pacific system weakened and drifted eastward, causing moderate to heavy snow over the central Plains and middle Mississippi Valley. Elsewhere, a low pressure center created heavy rain along the western Gulf coast on Tuesday while rain was scattered across the Southeast and dry, cool weather prevailed over the Ohio Valley, mid-Atlantic, and Northeast.

At mid-week, the low pressure system over the western Gulf coast intensified as it moved eastward, bringing heavy rain and severe weather from eastern Texas to the southern Atlantic coast. The first Pacific frontal system also swept eastward, spreading precipitation across

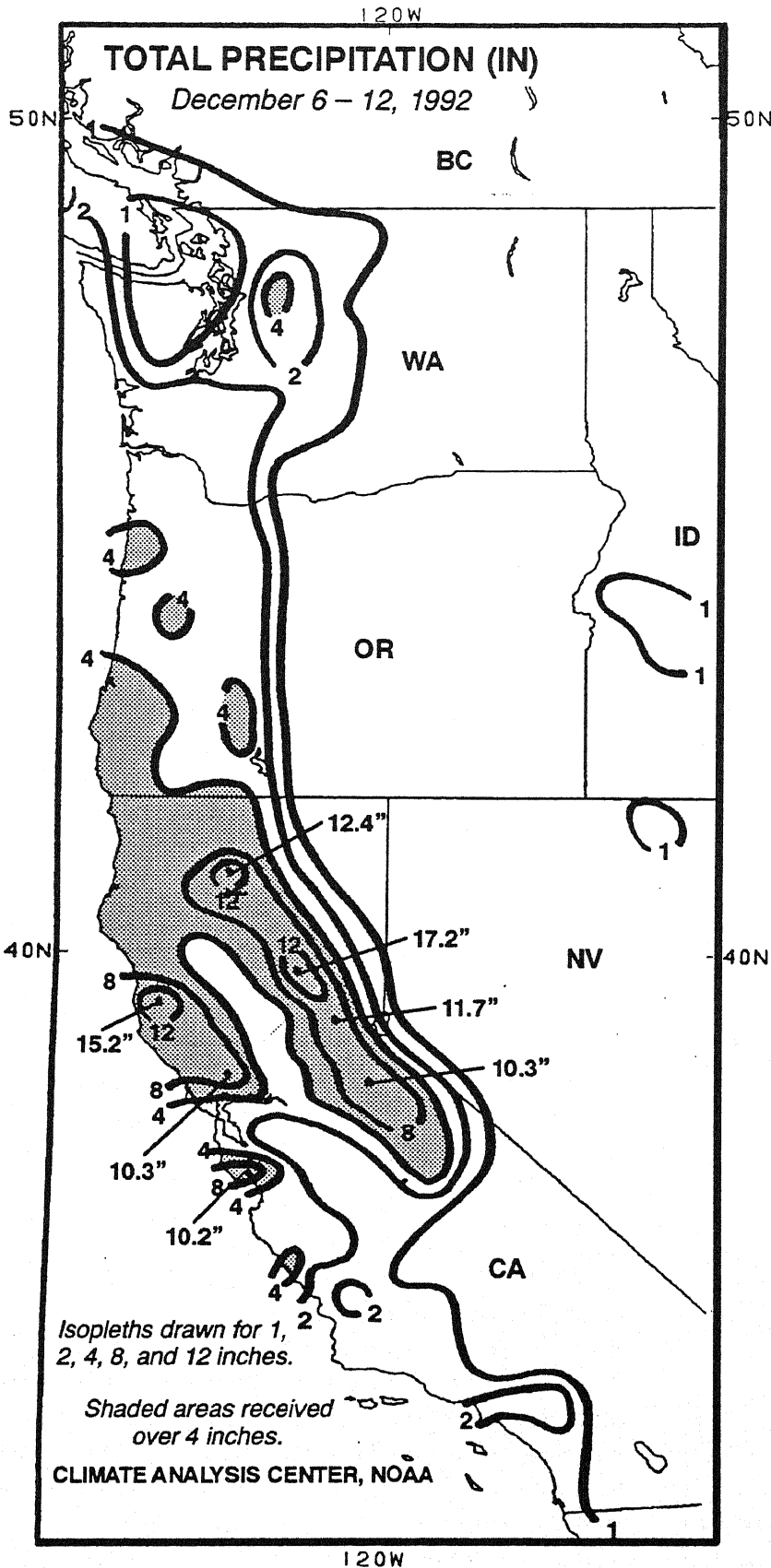
much of the Mississippi and Ohio Valleys and Great Lakes. During the latter part of the week, these two systems merged into a low pressure center that veered northward up the Atlantic seaboard, dumping heavy snow over the higher elevations of the mid-Atlantic and Northeast and pounding the coast with heavy surf and torrential rain. At week's end, the storm brought blizzard conditions to the Northeast as damaging high tides continued to batter much of the northern and middle Atlantic coastline. In the Far West, high wind, rains, and snow in the higher elevations continued to prevail over northern California and the Northwest while snow was widespread in the central and northern Rockies.

According to the River Forecast Centers, the greatest weekly precipitation totals (between ten and seventeen inches) saturated the Cascade and Sierra Nevada ranges. More than two inches soaked much of the Pacific seaboard, the mid-Atlantic, and southern New England. Totals of two or more inches were also scattered across the Southwest, the central Rockies, the southeastern Plains, the central Gulf coast, the Southeast, southeastern Alaska, and western Hawaii. Light to moderate amounts were observed in the Great Lakes, the middle Mississippi and Ohio Valleys, the central Plains, and the remainders of the Atlantic coast states, Southeast, lower Mississippi Valley, southern Plains, Southwest, Rockies, Far West, southeastern Alaska, and Hawaii. Little or no precipitation fell on the upper Mississippi Valley, northern Plains, and the rest of Alaska.

Warmer than normal conditions prevailed in central California, the Great Basin, the northern Rockies, the northern Plains, the middle Missouri and upper Mississippi Valleys, the upper Great Lakes, and the southwestern Plains. Weekly departures greater than +6°F were observed in the northern Plains, the upper Mississippi Valley, and the upper Great Lakes. In Alaska, abnormally warm weather was confined to the south-central and southeastern portions of the state, with departures of up to +7°F recorded in the panhandle.

In contrast, unseasonably cool weather dominated the Northwest, Southwest, northern and southern Rockies, central High Plains, middle and lower Mississippi and Ohio Valleys, Southeast, mid-Atlantic, and Northeast, with weekly departures between -6°F and -9°F in the interior Pacific Northwest, Southwest, Southeast, and central Appalachians. Below normal temperatures were also observed across northern and western Alaska, with departures between -6°F and -13°F in southwestern sections.

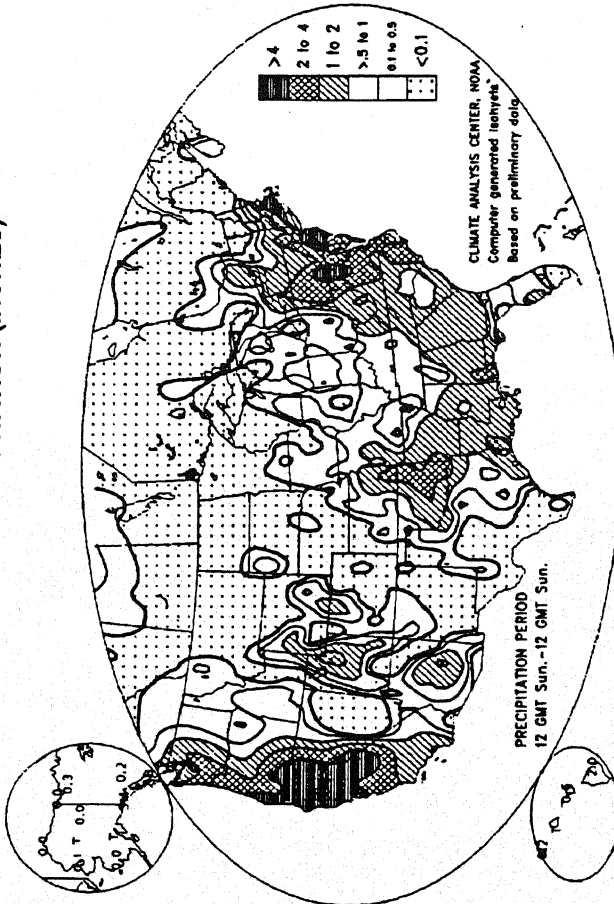
NORTH AMERICAN CLIMATE HIGHLIGHTS FEATURE



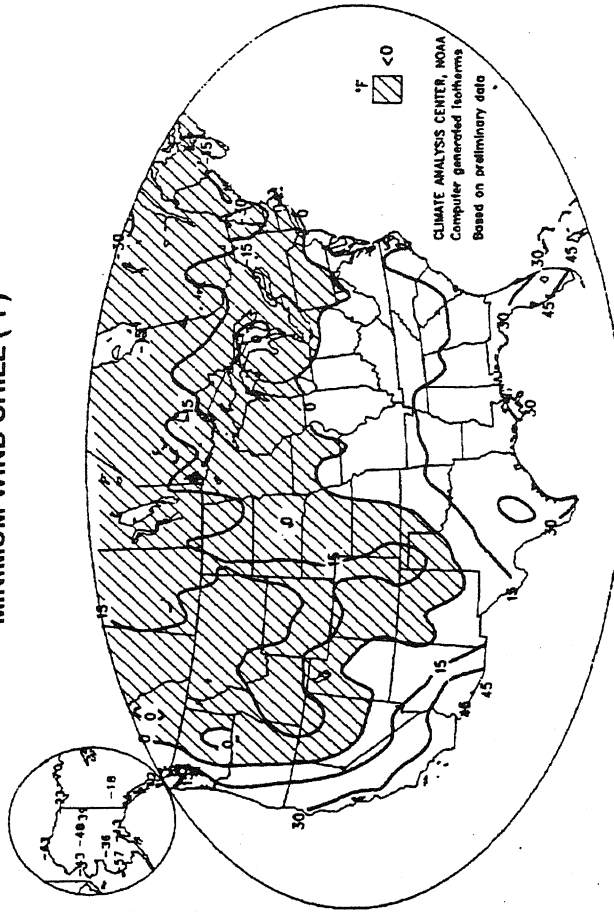
TWO STRONG PACIFIC STORMS DROP HEAVY PRECIPITATION ON MUCH OF THE FAR WEST. Early last week, a strong Pacific frontal system (which would eventually fuel the powerful Nor'easter along the Atlantic Seaboard late in the week) brought heavy precipitation and strong winds to parts of the Far West, especially northern California, the Sierra Nevadas, and the southern Cascades. Nearly 30 inches of snow whitened Donner Summit, CA on Saturday (12/5) and Sunday while press reports indicated that over four inches of rain fell on Montebello, San Gabriel, and Anaheim. Up to two feet of standing water flooded freeways near Los Angeles, and minor wind damage was reported throughout the metropolitan area. As the storm moved east of the region, several inches of snow piled up on some of the higher elevations of southern California and the Southwest. Around midweek, another Pacific system swept onshore, dumping more heavy snow on the southern half of the Cascades and the Sierra Nevadas. Diamond Peak, CA reported 3.5 feet of new snow on Wednesday and a total of seven feet on the ground. Lesser amounts of snow were also observed in portions of Oregon, northeastern Nevada, and northern Utah, with wind gusts of up to 101 mph observed in the latter region. The intense precipitation was welcomed as the area entered its seventh consecutive year of drought. California's State Climatologist indicated that continuing ample and timely precipitation would be necessary to completely alleviate the drought's affects. According to the California Drought Center in Sacramento, the state's 155 major reservoirs currently contain only a little more than half of normal pre-drought supplies.

UNITED STATES WEEKLY CLIMATE CONDITIONS (December 6 – 12, 1992)

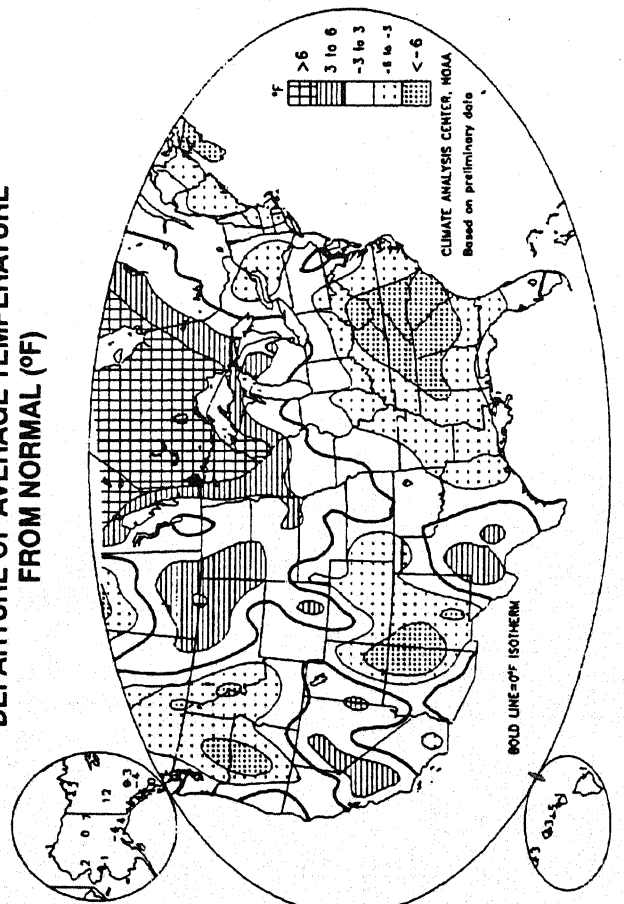
OBSERVED PRECIPITATION (INCHES)



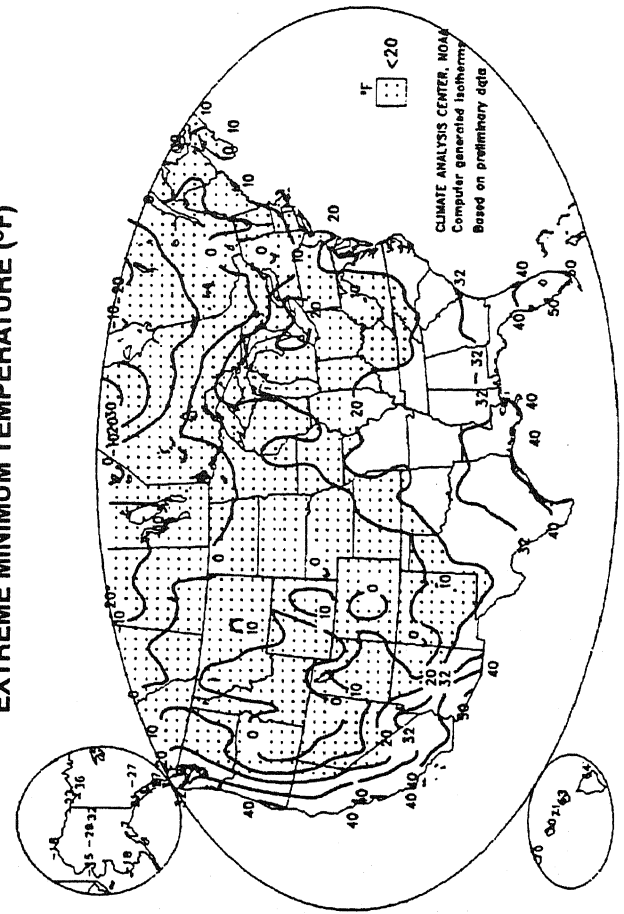
MINIMUM WIND CHILL (°F)



DEPARTURE OF AVERAGE TEMPERATURE FROM NORMAL (°F)

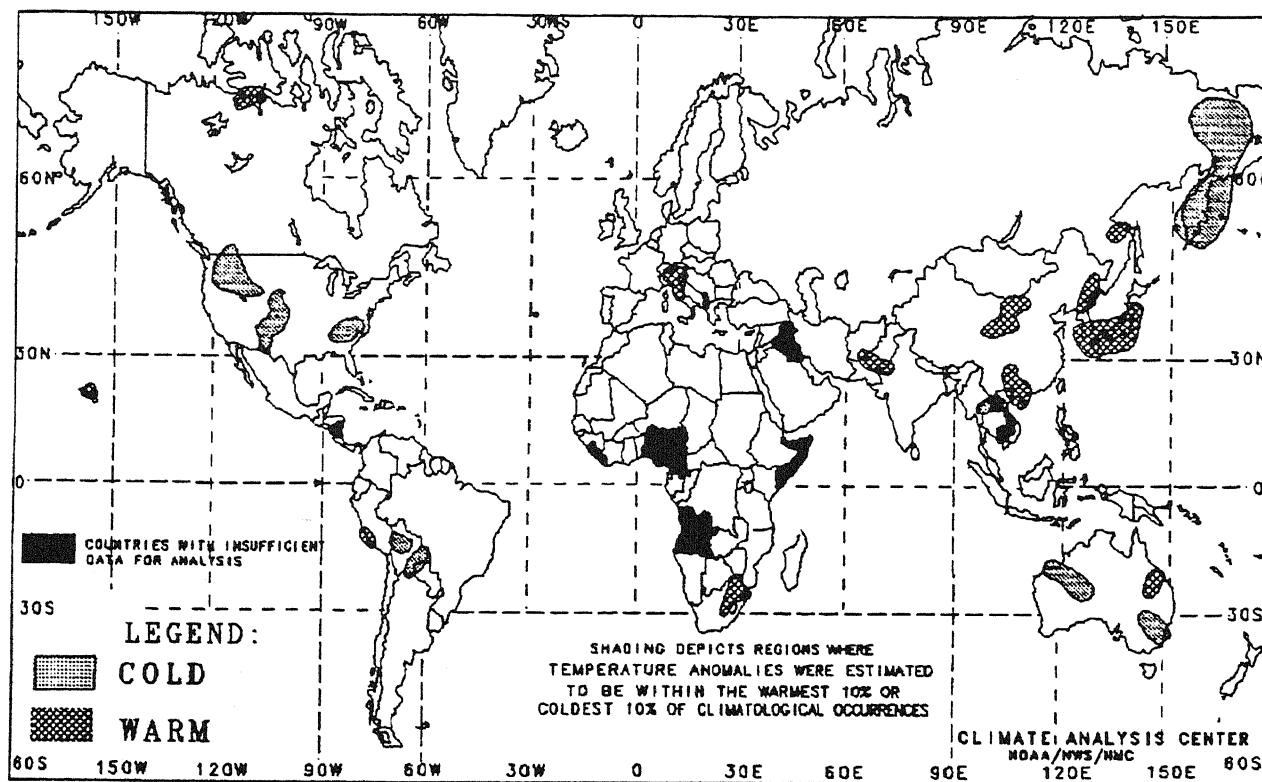


EXTREME MINIMUM TEMPERATURE (°F)



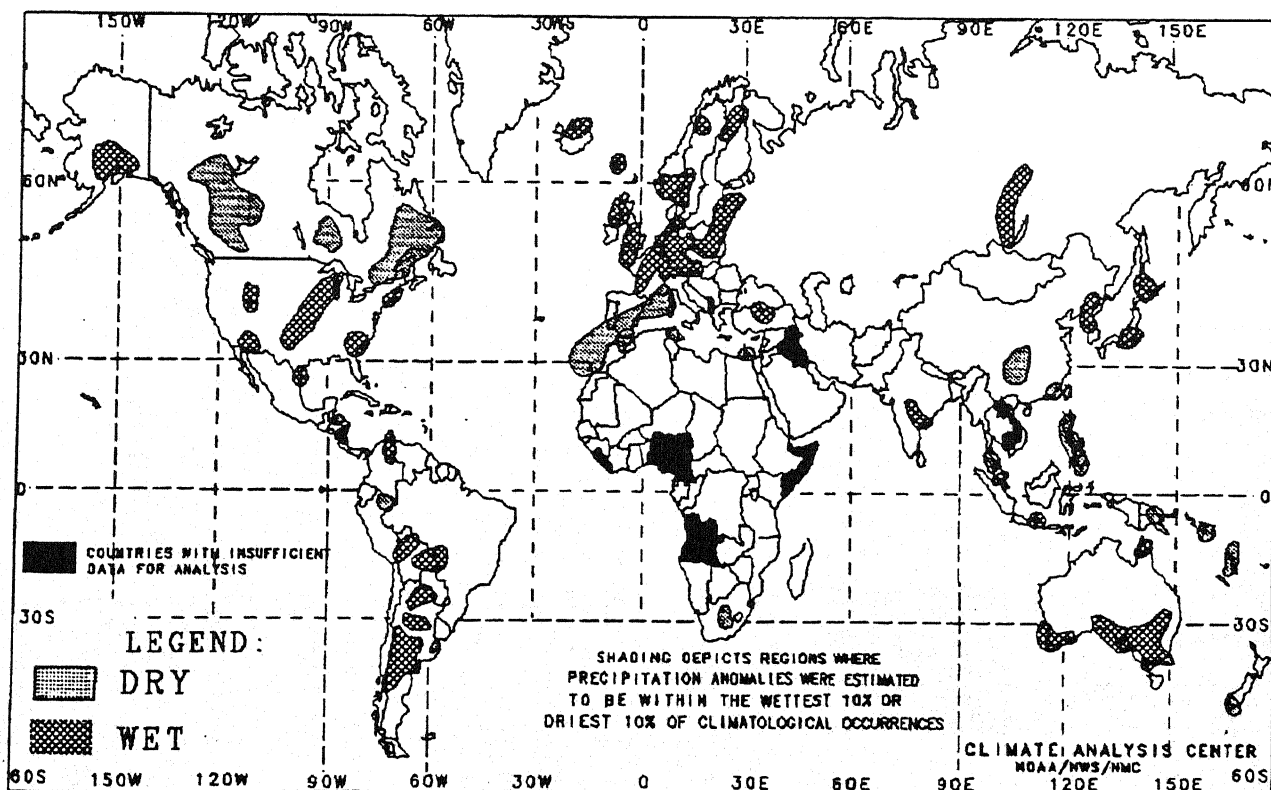
2-WEEK GLOBAL TEMPERATURE ANOMALIES

NOVEMBER 29 - DECEMBER 12, 1992



4-WEEK GLOBAL PRECIPITATION ANOMALIES

NOVEMBER 15 - DECEMBER 12, 1992



UNITED STATES SEASONAL CLIMATE SUMMARY

AUTUMN (SEPTEMBER – NOVEMBER) 1992

Unseasonably cool air penetrated the Pacific Northwest and the central Plains in early September. The cool air and associated moisture brought relief from wildfires that scorched thousands of acres in the Far West. A steady progression of cold fronts brought severe thunderstorms, heavy rains, and a few tornadoes to the middle of the country as the month progressed. Meanwhile, bitterly cold weather overspread much of Alaska as single-digit temperatures established many new record daily lows. At the end of September, Tropical Storm Danielle lashed North Carolina's Outer banks with heavy rains, rough surf, and strong winds before making landfall just south of Ocean City, MD. Heavy rains pushed many rivers to flood stage in Indiana while early-season snows blanketed north-central New York as September drew to a close.

October opened with the earliest snow on record in St. Johnsbury and Burlington, Vermont, and snow also blanketed parts of Colorado, Wyoming, Nebraska, and South Dakota. Frequent blasts of Arctic air plunged into the nation's midsection while the Southwest baked in summer-like heat. Heavy rains deluged southeastern Missouri during the month while heavy thunderstorms pounded the Southwest and southern Plains. October closed with a major winter-type storm affecting the Far West. Heavy rain soaked the northern half of the West Coast while snow blanketed the Cascades and northern Sierra Nevadas, with up to 30 inches burying western Nevada near Lake Tahoe. Farther north, two feet of snow blanketed the mountains near Anchorage, AK as exceptionally low temperatures continued to plague northern and central parts of the state. In sharp contrast, summer-like heat baked the southern Plains and lower Mississippi Valley in late October.

The approaching winter season became evident during November as heavy snow blanketed parts of the Rockies and the northern tier of states. A major early-season winter storm dumped heavy snow on western Kansas and the Panhandles of Texas and Oklahoma late in November. In sharp contrast, summer-like weather prevailed in the Southeast while outbreaks of severe thunderstorms, packing heavy rains, hail, strong wind gusts, and numerous tornadoes, battered the South, the Atlantic Coast, and the Tennessee and Ohio Valleys twice during the month. In addition, slow-moving thunderstorms drenched south-central Texas, and heavy rains caused flooding in Miami, FL. In California, abnormally dry weather prevailed as some locations received less than an inch of rain. Continued bitterly cold conditions early in the month gave way to extraordinarily mild weather in Alaska as temperatures soared into the forties as far north as Fairbanks.

According to the River Forecast Centers, the greatest seasonal precipitation totals (more than 18 inches) were measured across the east coast of Florida, the central Gulf Coast, the southern and central Appalachians, the western Ozarks and eastern Oklahoma, and the northern Cascades and Pacific Coast. As much as 39 inches drenched the mountains of southwestern North Carolina. The five easternmost regions as defined by the National Climatic Data Center (NCDC) received above median autumn precipitation, with Autumn 1992 ranking as the 9th wettest in the Southeast since 1895 (page 9). On a statewide basis, Iowa and Georgia experienced the 6th wettest such season in the last 98 years while Alabama ranked 8th. Heavy rains also inundated southeastern Alaska, with amounts ranging from 23 inches at Sitka to 71 inches at Yakutat. Across Hawaii, above normal precipitation soaked the islands of Maui and Hawaii, where Hilo received over 46 inches of rain.

Subnormal precipitation was reported in the southern High Plains, the desert Southwest, and the central Pacific Coast. Many parts of western Texas and southern New Mexico received less than half the normal seasonal amount (page 8). The four westernmost NCDC regions reported submedian precipitation totals, with the West experiencing the 11th driest autumn in 98 years of record. California reported the 10th driest such season since records began in 1895 (page 12).

Temperatures averaged 2°F to 4°F below normal in the central Plains, upper Midwest, and eastern Great Lakes (page 10). Although eight of the nine NCDC regions and 41 of the 48 contiguous states experienced below median autumn temperatures, Autumn 1992 ranked only as the 30th coldest nationally among all such seasons since 1895. Only the Northeast, with a rank of 17, was among the twenty coldest autumns since records began, and only two states, Massachusetts (6th) and Connecticut (9th), endured one of the ten coldest such seasons on record. Large negative departures covered much of Alaska, where very cold conditions were recorded until mid-November. Temperatures averaged up to 6°F below normal at some locations.

In sharp contrast, persistently warm conditions were widespread across much of California and Arizona, with temperatures averaging up to 5°F above normal (page 10). Just one region, the West, and seven states (AZ, CA, FL, MT, NV, UT, and WY) experienced above median temperatures during Autumn 1992, with neither the West nor any of the seven states among the 10 warmest autumns in 98 years of record. Near normal temperatures prevailed across most of Hawaii.

PRECIPITATION PERCENTILES

AUTUMN (SEPTEMBER – NOVEMBER) 1992

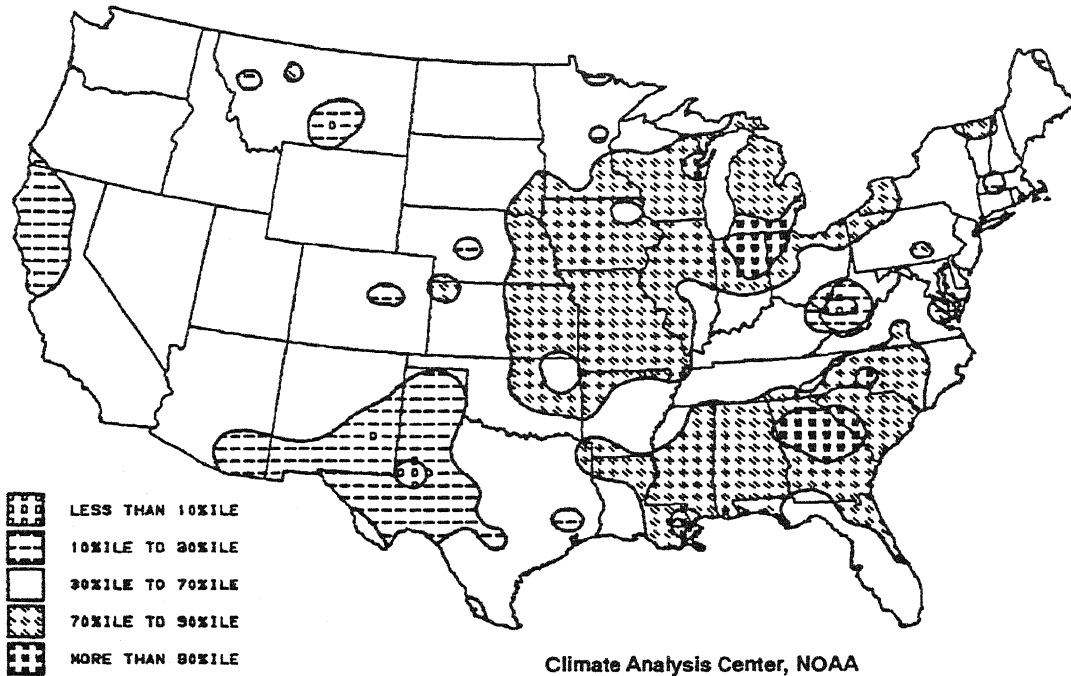


FIGURE 1. Autumn (September – November) 1992 Precipitation Percentiles. A wet month ($>70\%$ ile) was observed across much of the eastern Plains, the Midwest, the Great Lakes, and the Southeast, with Autumn 1992 among the wettest 10% of the historical distribution in parts of Georgia and South Carolina and in northern Indiana, northwestern Ohio, and southern Michigan. Climatologically significant dryness ($<30\%$ ile) was limited to northern California, portions of Texas, New Mexico, and Arizona, and much of West Virginia.

PERCENT OF NORMAL PRECIPITATION

AUTUMN (SEPTEMBER – NOVEMBER) 1992

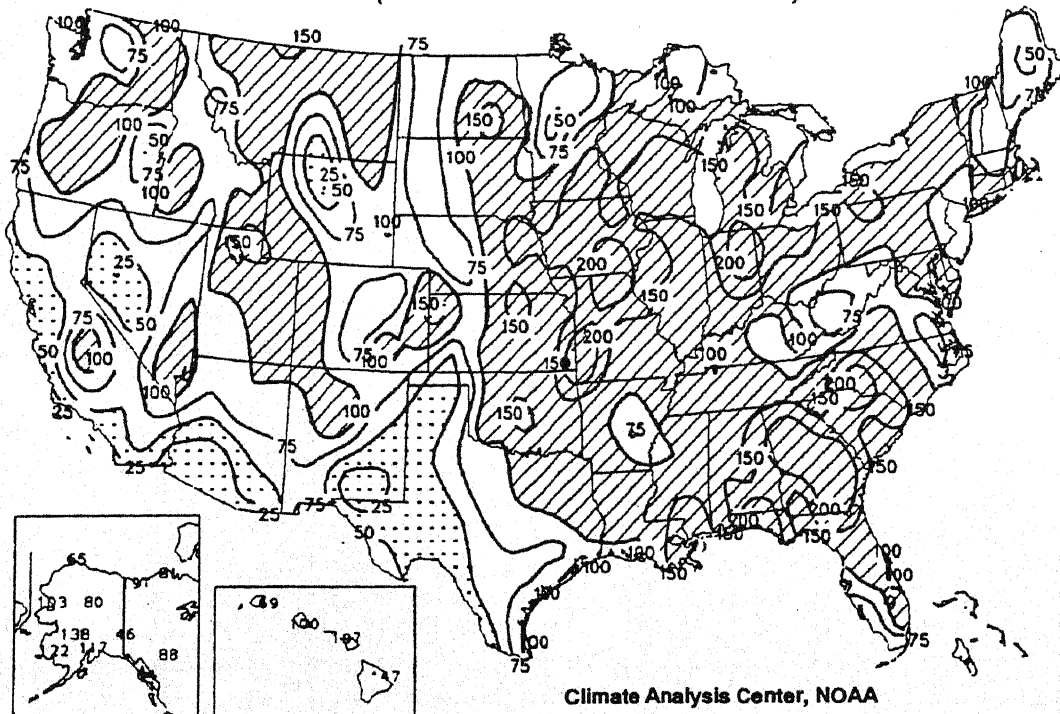
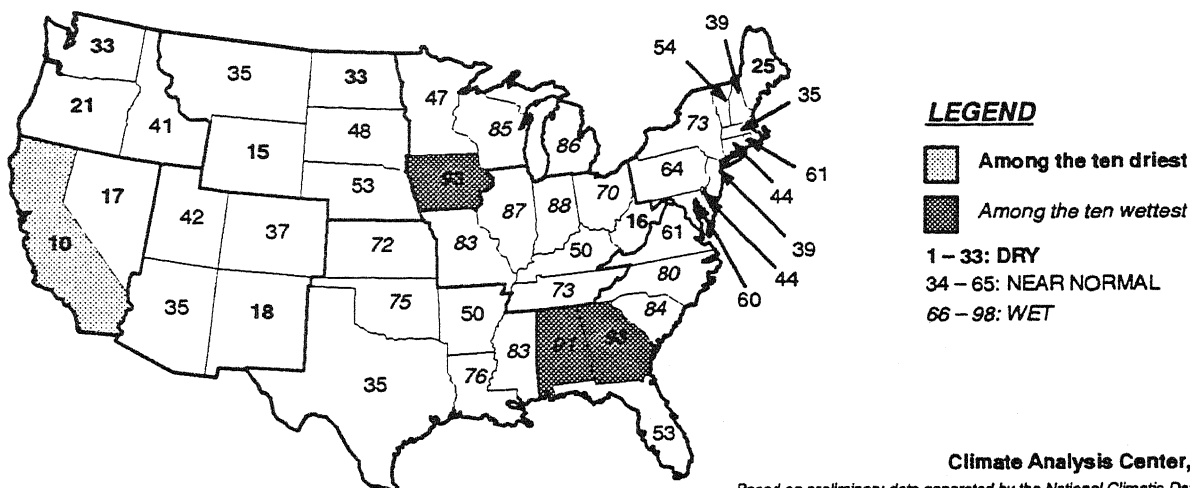


FIGURE 2. Autumn (September – November) 1992 Percent of Normal Precipitation. Near to above normal precipitation was observed across most of the country, especially east of the Rockies. Only parts of central Maine, the central and southern High Plains, the northern and southern Rockies, the Southwest, the Great Basin, and southern and western California received under half of normal precipitation.

HISTORICAL PRECIPITATION RANKINGS BY STATE

AUTUMN (SEPTEMBER – NOVEMBER) 1992

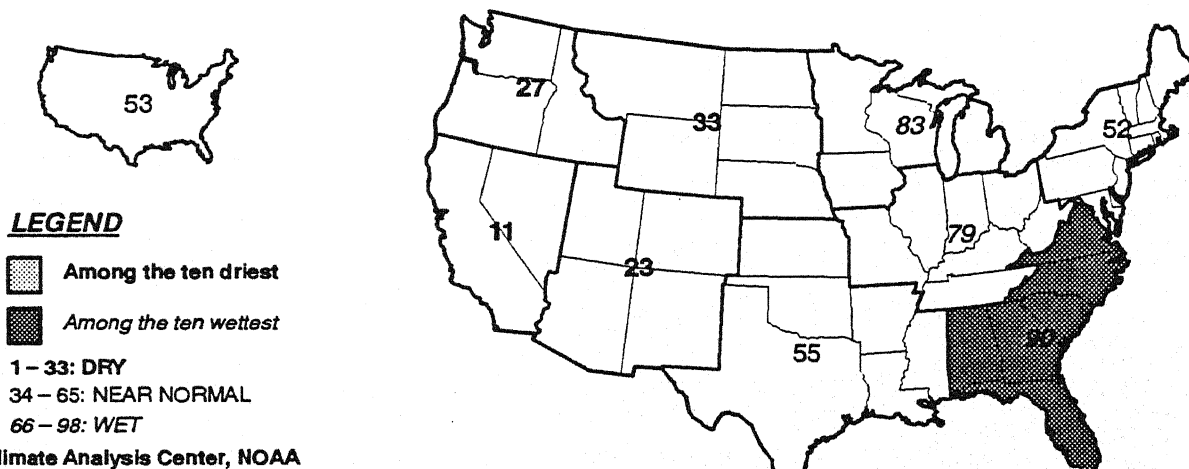


Based on preliminary data generated by the National Climatic Data Center

This chart depicts the ranking of the specific parameter, as measured during the period indicated, with respect to all other such periods on record since 1895.

HISTORICAL PRECIPITATION RANKINGS BY REGION AND NATION

AUTUMN (SEPTEMBER – NOVEMBER) 1992

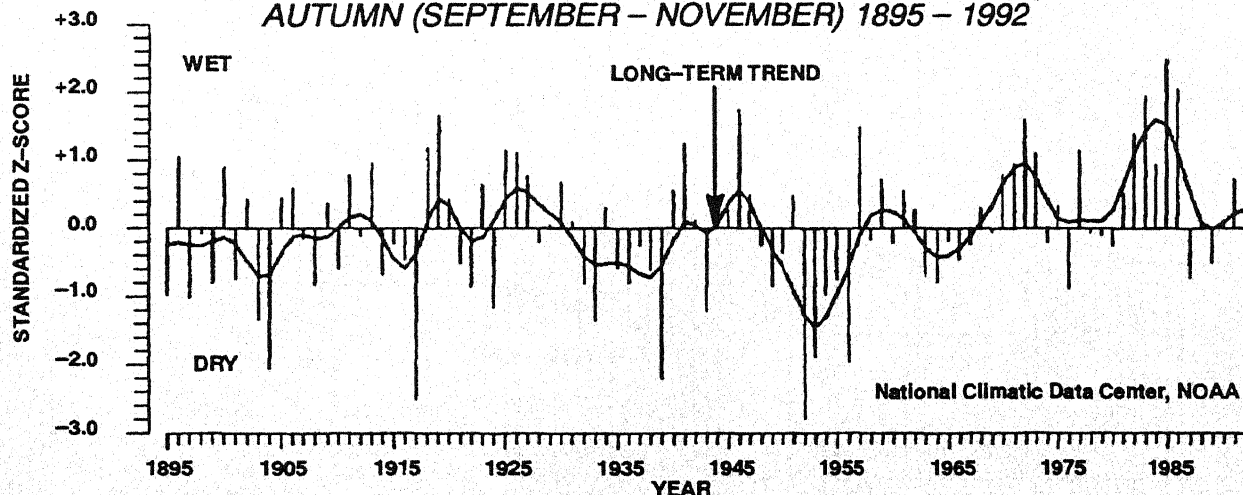


Based on preliminary data generated by the National Climatic Data Center

This chart depicts the ranking of the specific parameter, as measured during the period indicated, with respect to all other such periods on record since 1895.

U. S. NATIONAL NORMALIZED PRECIPITATION INDEX

AUTUMN (SEPTEMBER – NOVEMBER) 1895 – 1992



NATIONAL MEAN AUTUMN (SEPTEMBER – NOVEMBER) PRECIPITATION INDEX, as computed by the National Climatic Data Center. The Autumn precipitation index was slightly above the median for the third consecutive year. The index takes local normals into account so that regions with large precipitation amounts do not dominate the index value.

TEMPERATURE PERCENTILES

AUTUMN (SEPTEMBER – NOVEMBER) 1992

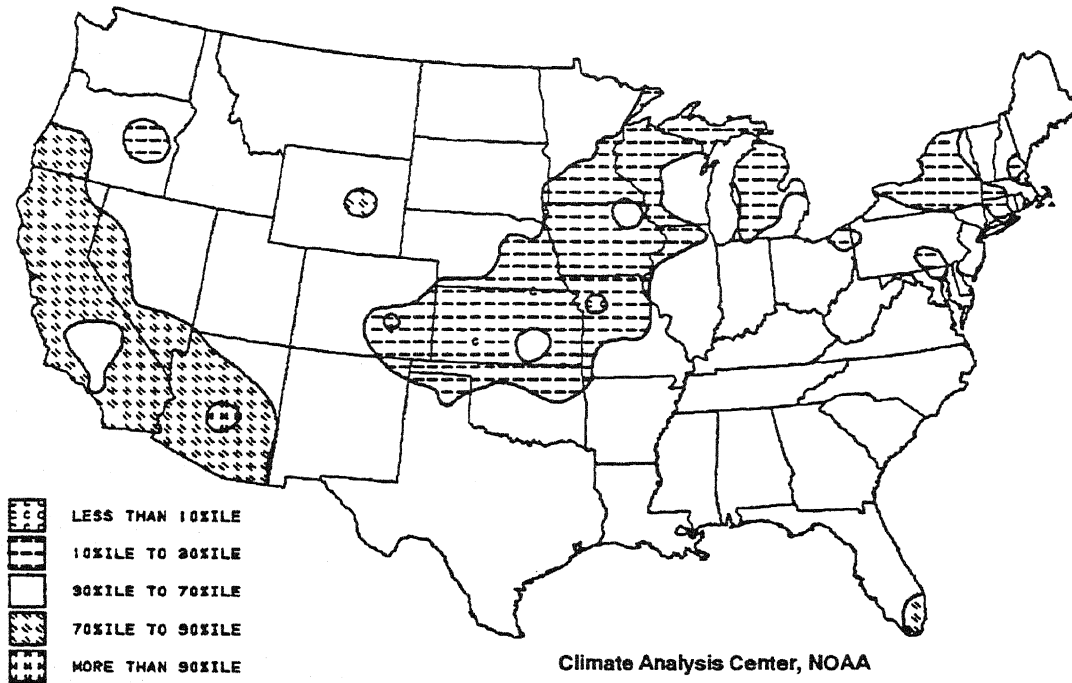


FIGURE 3. Autumn (September – November) 1992 Temperature Percentiles. Very warm conditions (>70%ile) prevailed in southwestern Oregon, western Nevada, and most of California and Arizona. In contrast, significantly cooler than normal weather (<30%ile) dominated the central Plains, the Midwest, the Great Lakes, and parts of the mid-Atlantic and southern New England.

DEPARTURE OF AVERAGE TEMPERATURE FROM NORMAL (°F)

AUTUMN (SEPTEMBER – NOVEMBER) 1992

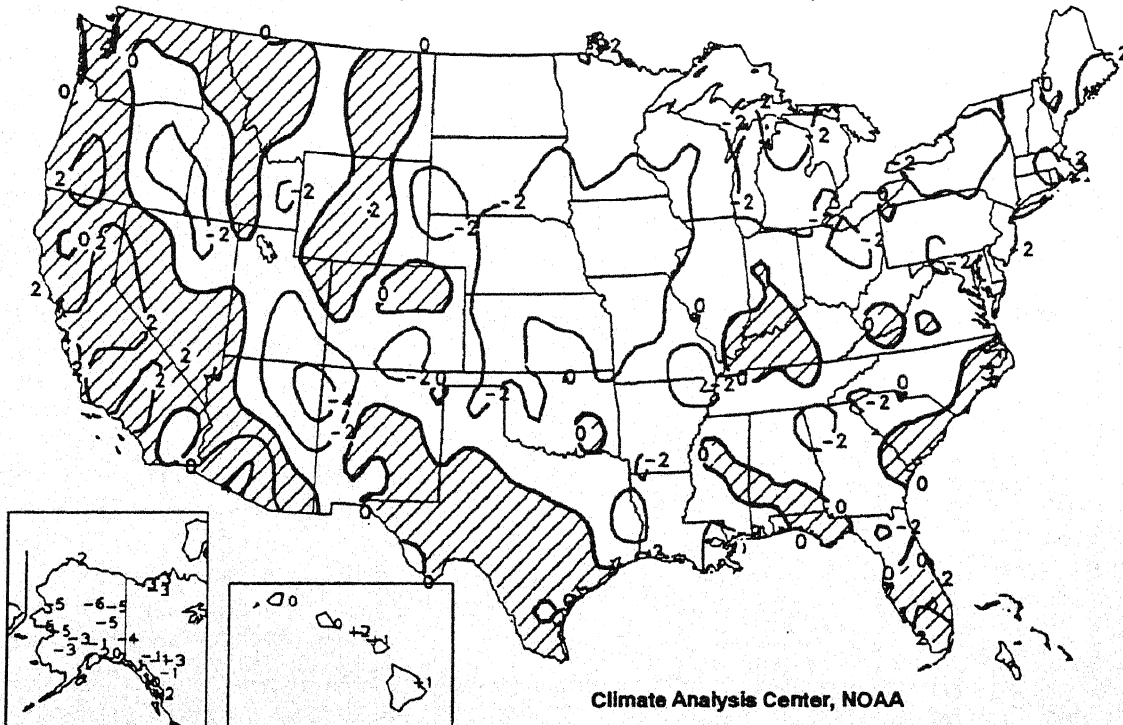
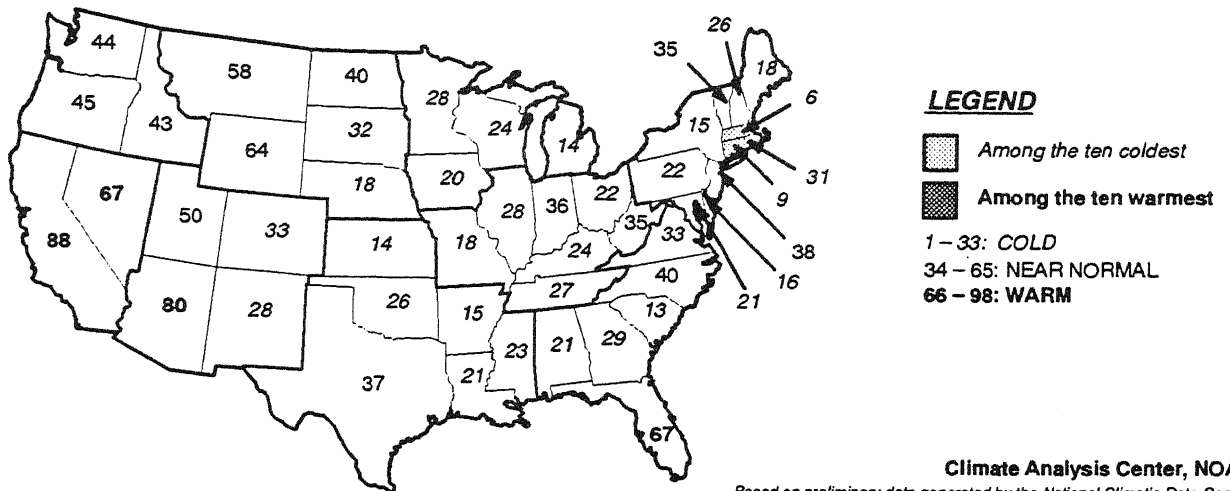


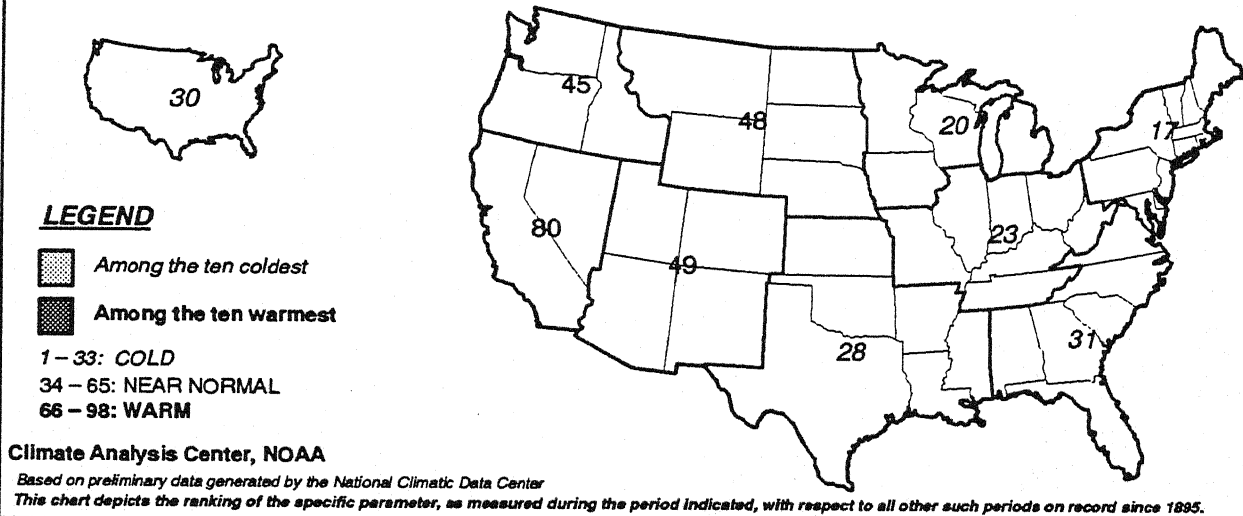
FIGURE 4. Autumn (September – November) 1992 Departure of Average Temperature from Normal. Temperatures averaged at least 2°F above normal through much of California, western Oregon, and southern Florida while monthly departures below -2°F covered much of the central Great Plains, the Great Lakes, parts of the northern Intermountain West, southern Rockies, and Northeast, and scattered locations across the lower and middle Mississippi Valley and the central and southern Appalachians.

HISTORICAL TEMPERATURE RANKINGS BY STATE AUTUMN (SEPTEMBER – NOVEMBER) 1992

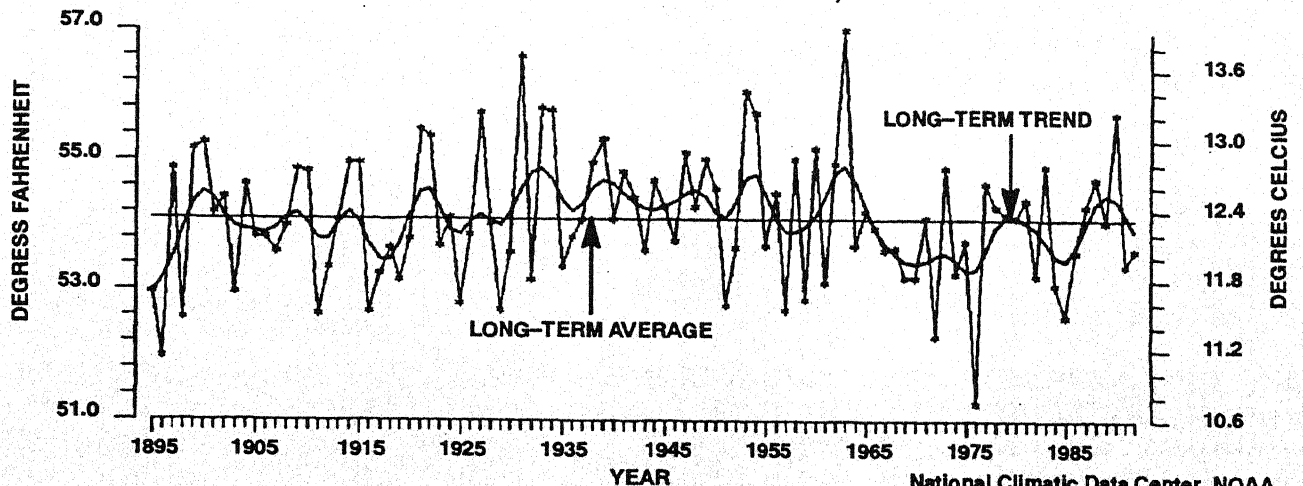


Based on preliminary data generated by the National Climatic Data Center
This chart depicts the ranking of the specific parameter, as measured during the period indicated, with respect to all other such periods on record since 1895.

HISTORICAL TEMPERATURE RANKINGS BY REGION AND NATION AUTUMN (SEPTEMBER – NOVEMBER) 1992

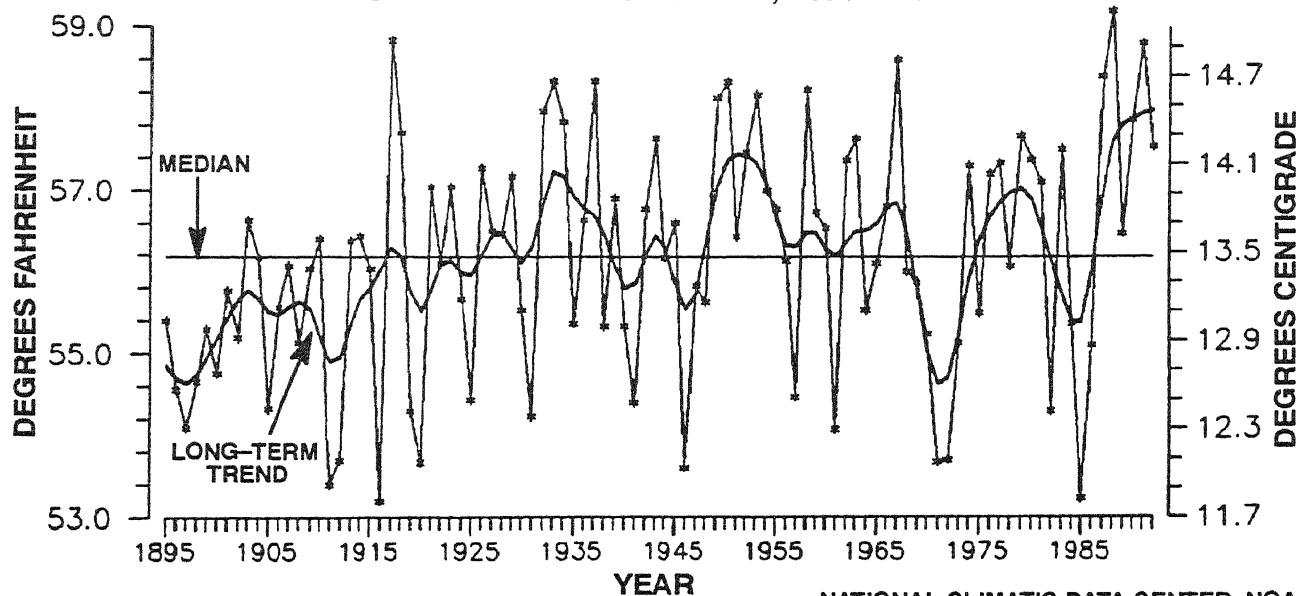


U. S. NATIONAL TEMPERATURE AUTUMN (SEPTEMBER – NOVEMBER) 1895 – 1992



NATIONALLY AVERAGED AUTUMN (SEPTEMBER – NOVEMBER) TEMPERATURES, as computed by the National Climatic Data Center.
Colder than normal weather dominated the country as Autumn 1992 became the 30th coldest such season since records began in 1895.

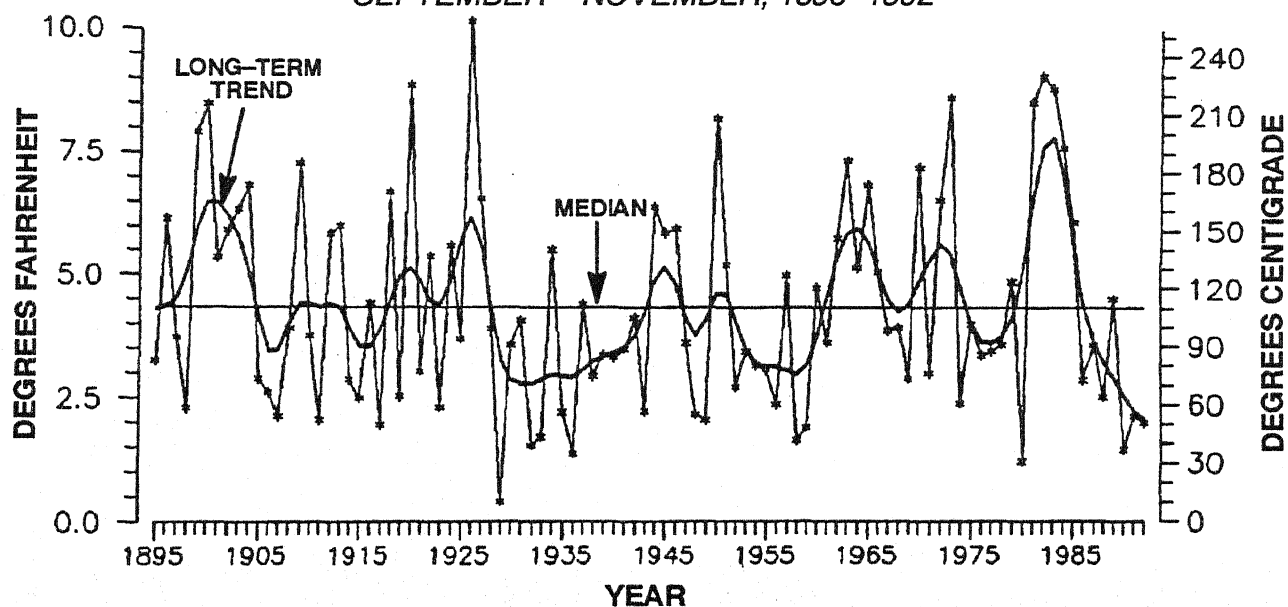
WEST REGION TEMPERATURE SEPTEMBER – NOVEMBER, 1895–1992



NATIONAL CLIMATIC DATA CENTER, NOAA

WEST REGION TEMPERATURES DURING AUTUMN (SEPTEMBER – NOVEMBER) 1895–1992, AS COMPUTED BY THE NATIONAL CLIMATIC DATA CENTER. *Above normal temperatures were observed across the West Region (CA and NV) for the sixth consecutive autumn, pushing the long-term trend to unprecedentedly high levels.*

CALIFORNIA STATEWIDE PRECIPITATION SEPTEMBER – NOVEMBER, 1895–1992

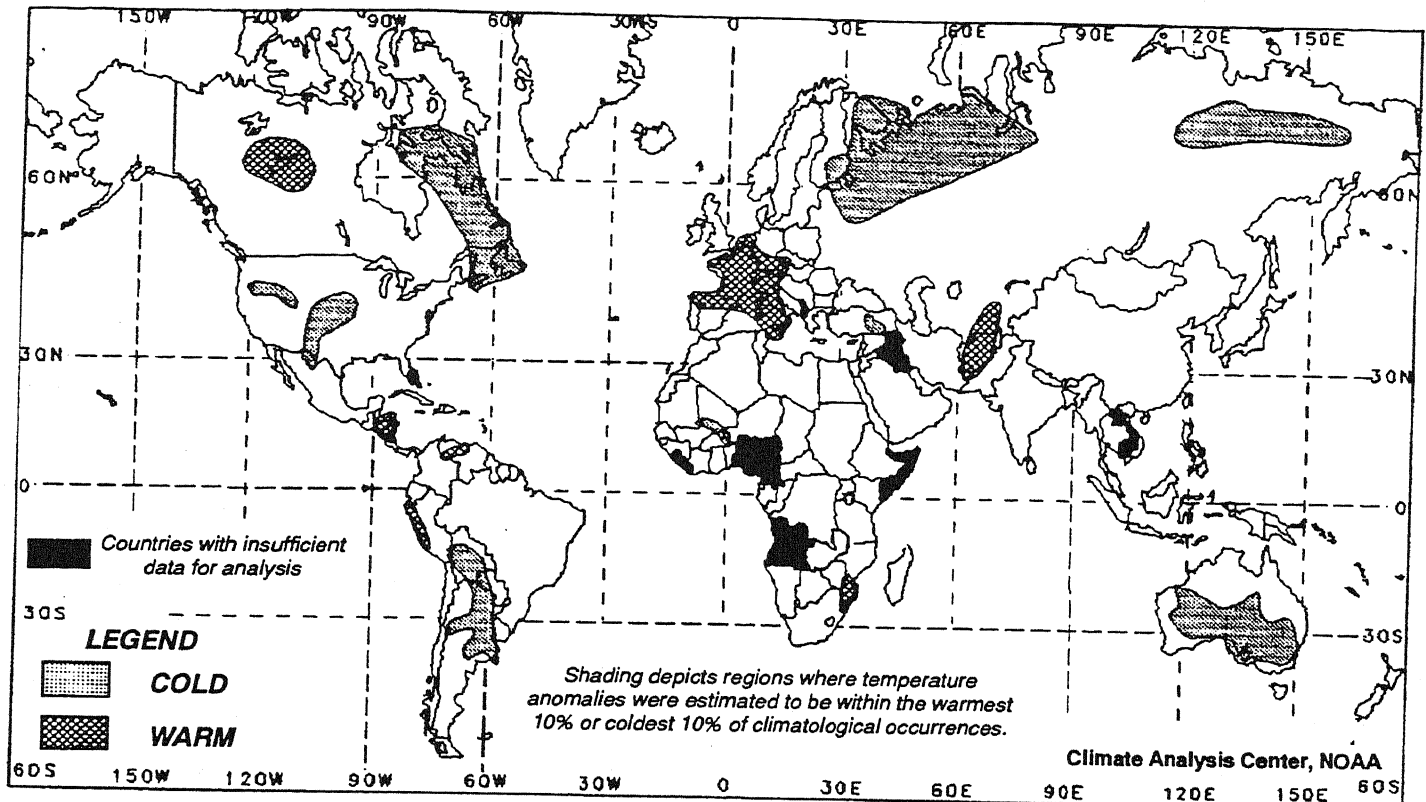


NATIONAL CLIMATIC DATA CENTER, NOAA

CALIFORNIA STATEWIDE PRECIPITATION DURING AUTUMN (SEPTEMBER – NOVEMBER) 1895–1992, AS COMPUTED BY THE NATIONAL CLIMATIC DATA CENTER. *For the sixth autumn in the last seven years, considerably below normal precipitation totals were observed across the state, sending the long-term trend to its lowest level on record.*

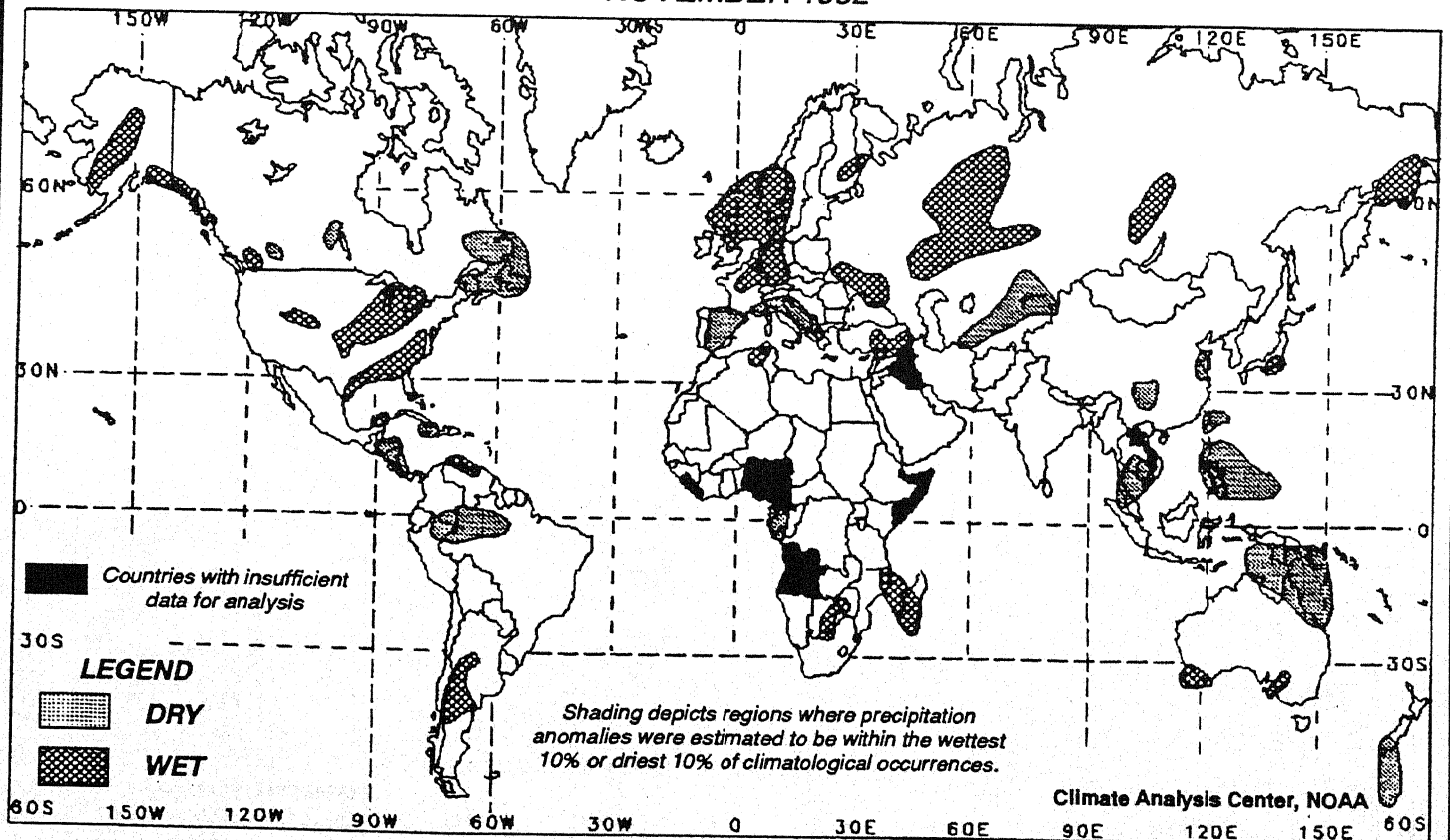
MONTHLY GLOBAL TEMPERATURE ANOMALIES

NOVEMBER 1992



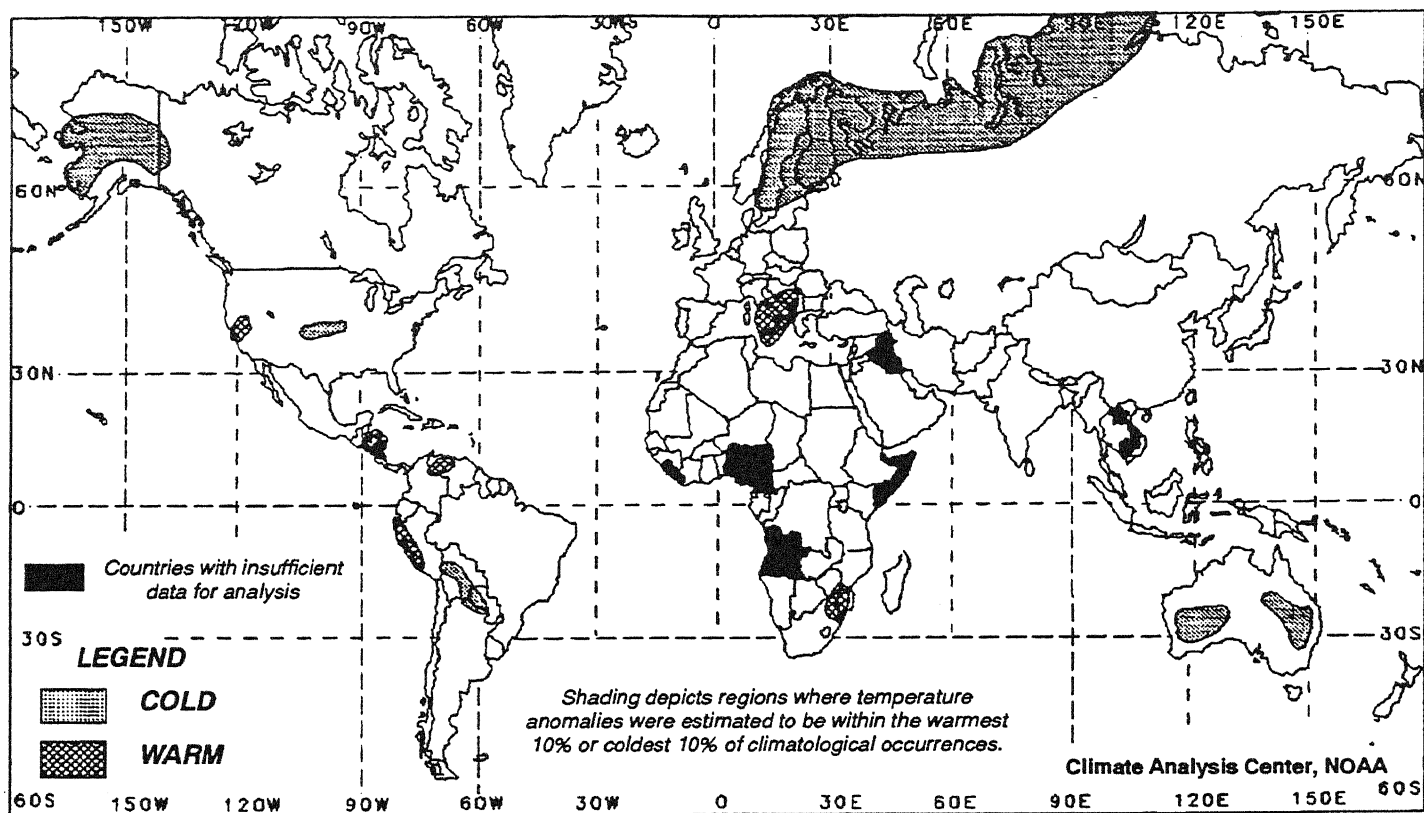
MONTHLY GLOBAL PRECIPITATION ANOMALIES

NOVEMBER 1992



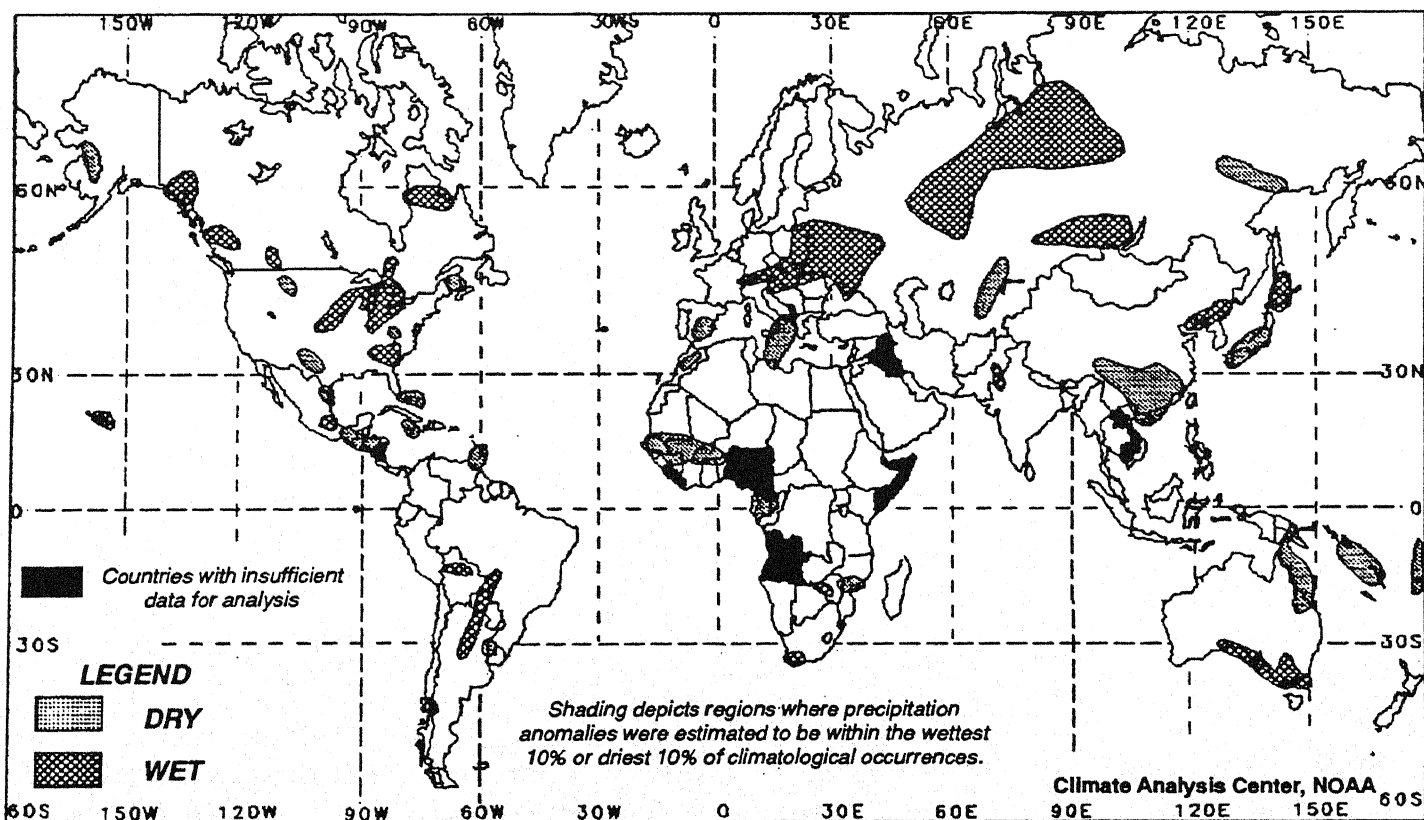
THREE-MONTH GLOBAL TEMPERATURE ANOMALIES

SEPTEMBER – NOVEMBER 1992



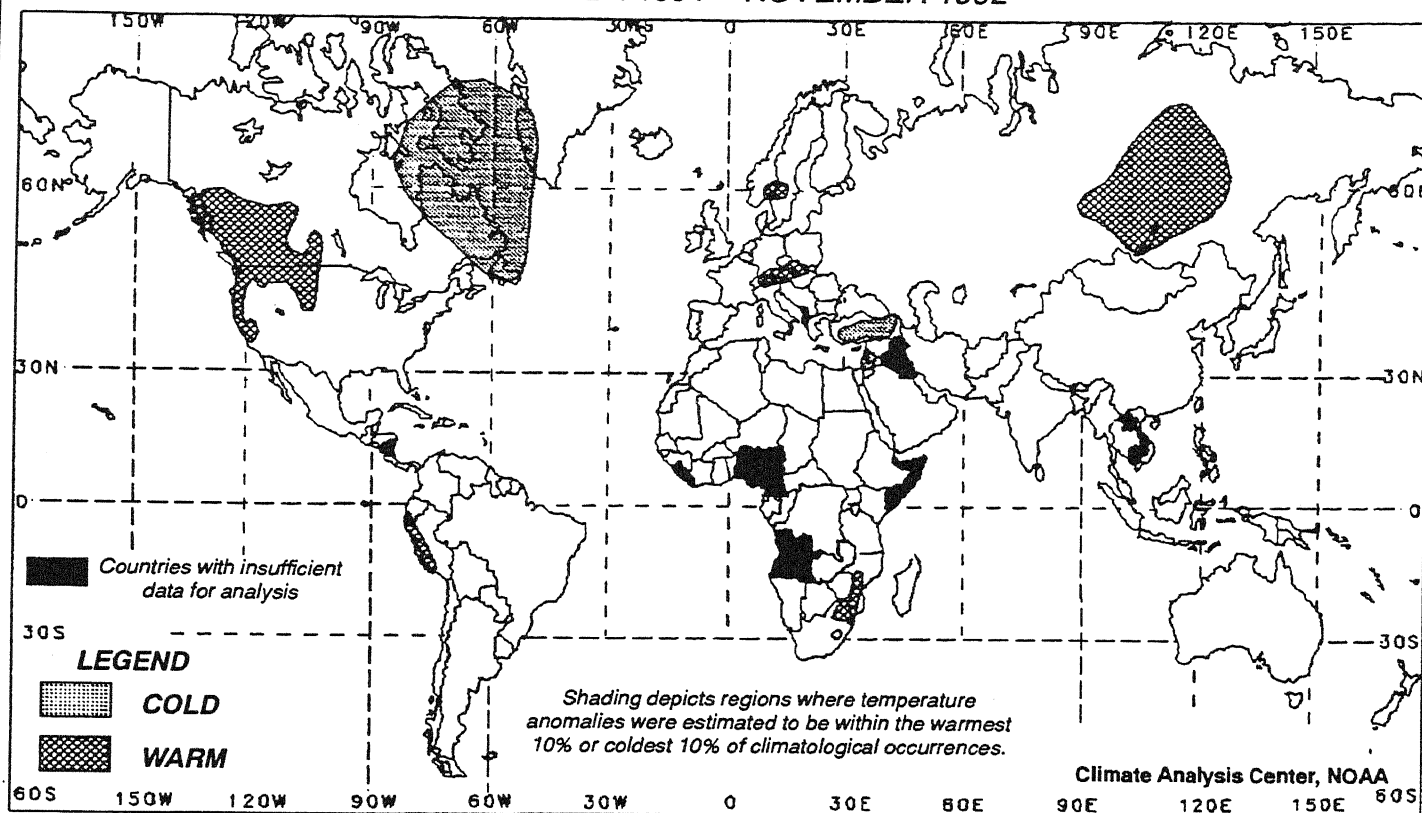
THREE-MONTH GLOBAL PRECIPITATION ANOMALIES

SEPTEMBER – NOVEMBER 1992



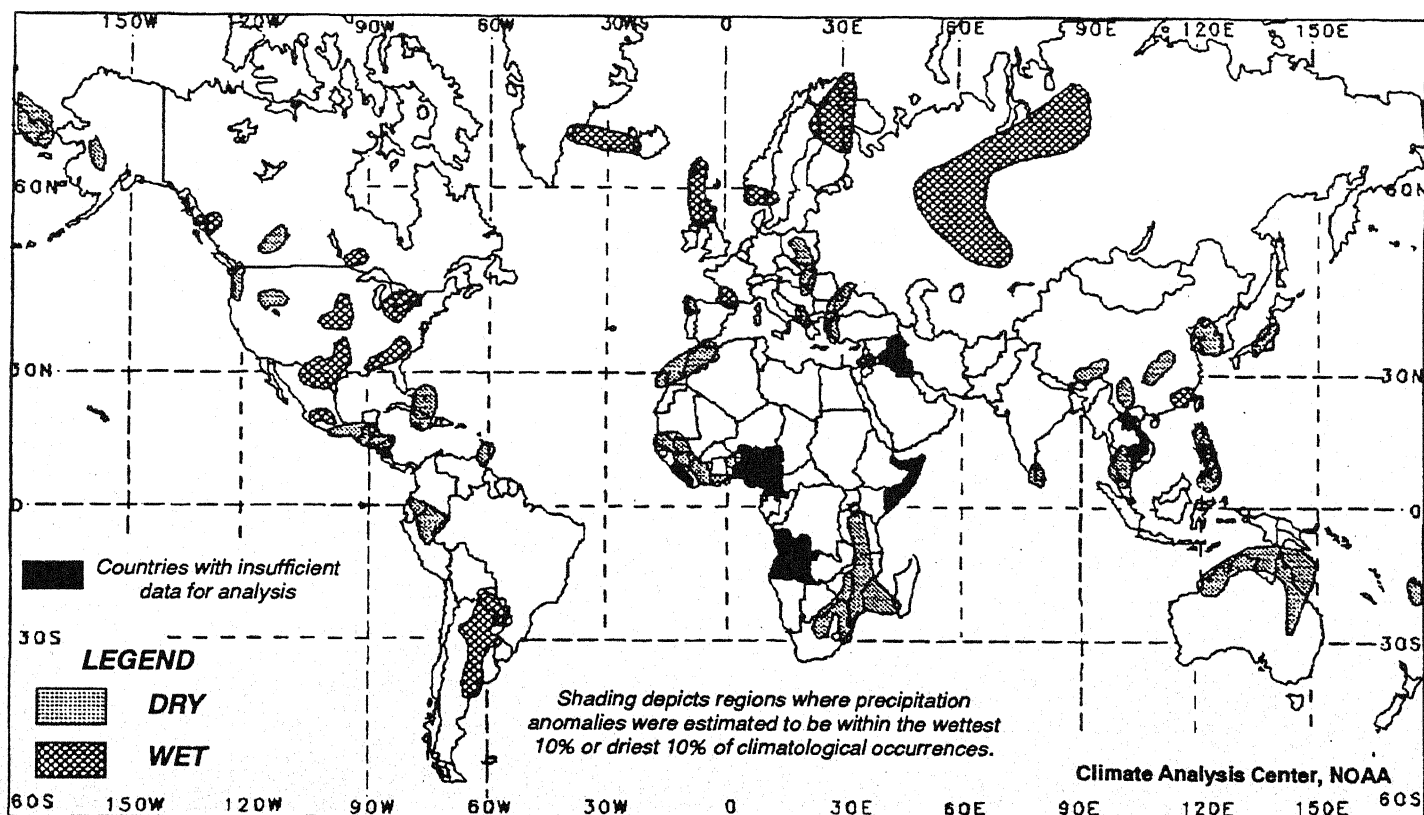
TWELVE-MONTH GLOBAL TEMPERATURE ANOMALIES

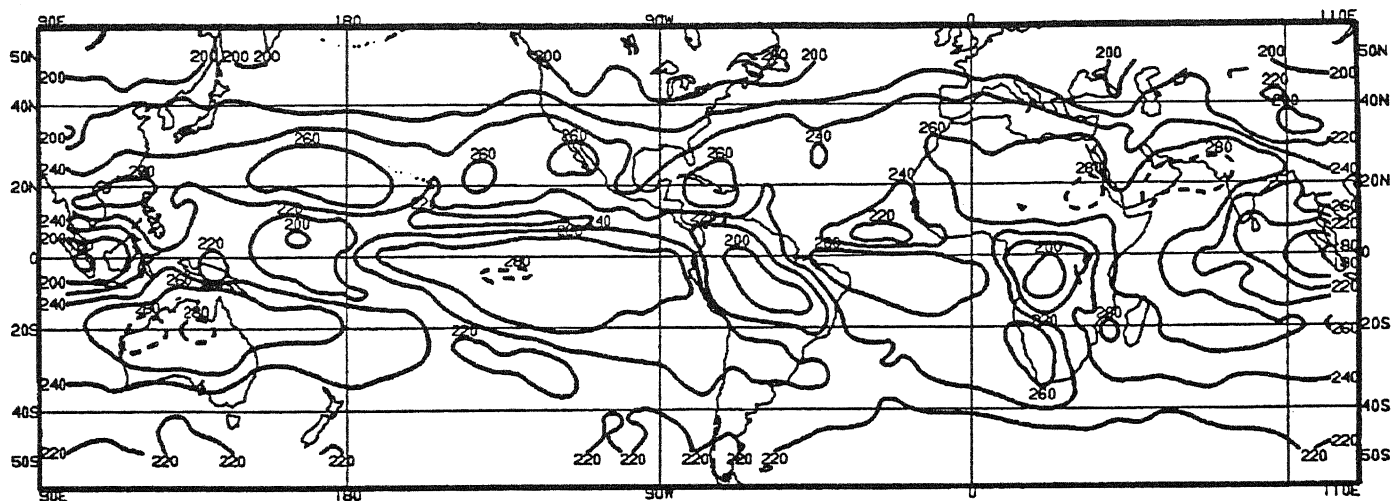
DECEMBER 1991 – NOVEMBER 1992



TWELVE-MONTH GLOBAL PRECIPITATION ANOMALIES

DECEMBER 1991 – NOVEMBER 1992



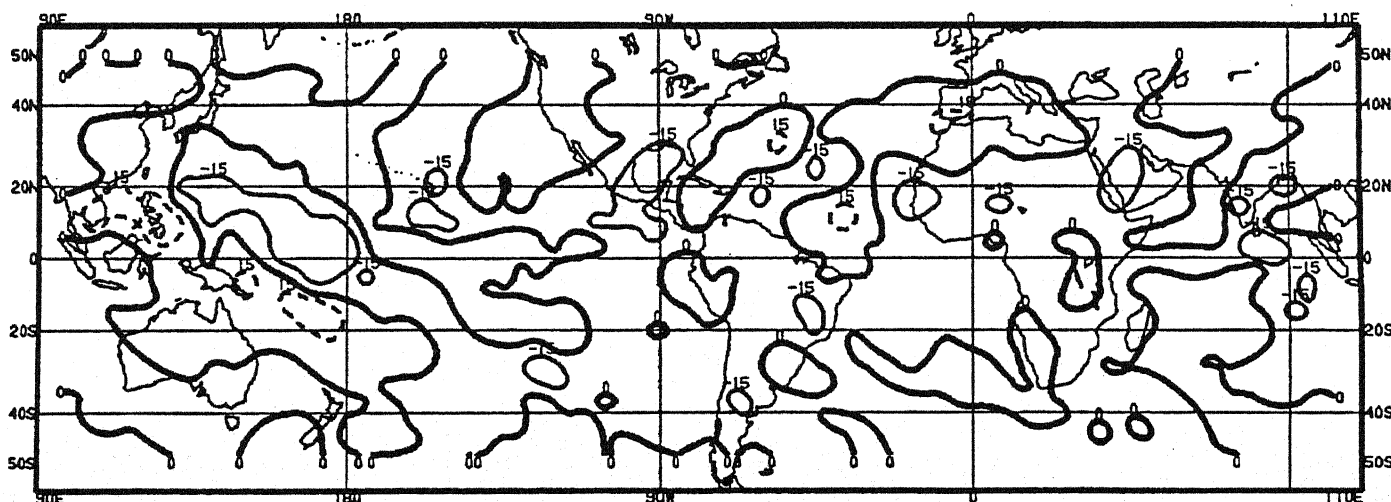


Monthly Mean Outgoing Long Wave Radiation (OLR) for November, 1992

EXPLANATION

The mean monthly outgoing long wave radiation (OLR) as measured by the NOAA-9 AVHRR IR window channel by NESDIS/SRL (top). Data are accumulated and averaged over 2.5° areas to a 5° Mercator grid for display. Contour intervals are 20 Wm^{-2} , and contours of 280 Wm^{-2} and above are dashed. In tropical areas (for our purposes $20^\circ\text{N} - 20^\circ\text{S}$) that receive primarily convective rainfall, a mean OLR value of less than 200 Wm^{-2} is associated with significant monthly precipitation, whereas a value greater than 260 Wm^{-2} normally indicates little or no precipitation. Care must be used in interpreting this chart at higher latitudes, where much of the precipitation is non-convective, or in some tropical coastal or island locations, where precipitation is primarily orographically induced. The approximate relationship between mean OLR and precipitation amount does not necessarily hold in such locations.

The mean monthly outgoing long wave radiation anomalies (bottom) are computed as departures from the 1979 - 1988 base period mean. Contour intervals are 15 Wm^{-2} , while positive anomalies (greater than normal OLR, suggesting less than normal cloud cover and/or precipitation) are dashed and negative anomalies (less than normal OLR, suggesting greater than normal cloud cover and/or precipitation) are solid.



Monthly Mean Outgoing Long Wave Radiation (OLR) Anomaly for November, 1992